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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/715,458
Filing Date: November 19, 2003
Appellant(s): SAITO ET AL.

William E. Curry
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 10/3/06 appealing from the Office action mailed 7/3/06.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,096,449	Fuglevand et al	8-2000
6,620,538	Bai et al	9-2003

6,447,939	Iwasaki	9-2002
2003/0003334	Yoshizawa et al	1-2003

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-7, 11, and 16-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Fuglevand et al (US 6096449). Regarding the amended claims 1 and 16, the Fuglevand et al reference discloses predetermined performance parameters that are determined by various means such as experiment, operational history or electric load (See column 8, lines 9-15). These predetermined performance parameters are equivalent to the predetermined operation patterns claimed by the applicant. It also discloses operating conditions such as voltage and current outputs that change the operational state of the fuel cell according to the predetermined performance parameters (See column 8, line 9-13). It also discloses a fuel cell and a method of controlling the fuel cell that comprises a controller which operates the fuel cell according to a predetermined operation condition and diagnoses a state of the fuel cell by detecting a change in the operational state of the fuel cell and comparing the change in the operational state to a predetermined operation condition (See column 2, lines 41-45). It also discloses a controller that diagnoses the state of the fuel cell upon sensing a given output voltage, output current, or an open state voltage at the voltage and current sensors and causes the valve to be adjusted into a predetermined fluid metering relationship relative to the supply of the fuel gas which increases or decreases the flow

amount of fuel gas (See column 3, lines 19-26). It also discloses a controller that determines whether there is a mechanical failure or deterioration due to a change in the output voltage that is less than a predetermined value (See column 8, lines 16-29).

Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuglevand et al (US 6096449) in view of Bai et al (US 6620538). The Fuglevand reference is applied to claim 1 for reasons stated above. However, Fuglevand et al does not expressly teach a temperature adjusting device and a controller that detects the internal resistance or temperature of the fuel cell, diagnoses the state of the fuel cell based upon the resistance or temperature and operates the fuel cell according to a predetermined temperature pattern. The Bai reference discloses temperature sensors "46" and a controller that determines the resistance of the fuel cell, detects the temperature of the fuel cell, diagnoses the state of the fuel cell based upon these parameters and operates the fuel cell according to a predetermined temperature level (see Figure 16 and column 6, lines 20-25 and column 12, lines 31-36). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Fuglevand fuel cell to include temperature sensors and a controller that detects the resistance and temperature of the fuel cell, diagnoses the state of the fuel cell based upon these parameter and operates the fuel cell according to a predetermined temperature level in order to improve the performance of the fuel cell by more accurately determining the operating state of the fuel cell.

Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuglevand et al (US 6096449) in view of Iwasaki (US 6447939). The Fuglevand

reference is applied to claim 1 for reasons stated above. However, Fuglevand et al does not expressly teach a fuel cell installed on a moving object, a power adjusting portion connected to an output terminal of the fuel cell, and a fuel gas supply portion. The Iwasaki reference discloses a fuel cell "21" installed on a vehicle, a electrical power adjuster "31" connected to an output terminal of the fuel cell, and a fuel gas supply "1", "3", "5" (see Figure 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to install the Fuglevand fuel cell in a vehicle with a electrical power adjuster and a fuel gas supply in order to provide an electrical power distribution system for a vehicle capable of achieving sufficient running performance.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fuglevand et al (US 6096449) in view of Iwasaki (US 6447939) as applied to claim 12, and further in view of Yoshizawa et al (US 2003/0003334). However, Fuglevand et al as modified by Iwasaki does not expressly teach a cooling system which cools the fuel cell. The Yoshizawa reference discloses a cooling system "22", "23", "24" which cools the fuel cell "20" (see Figure 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Fuglevand/Iwasaki fuel cell system to include a cooling system in order to improve the performance of the fuel cell by maintaining a heat balance between the heat generated by the fuel cell and the heat radiated by the cooling system.

(10) Response to Argument

The appellant argues that Fuglevand does not disclose or suggest that a fuel cell is operated according to at least one predetermined operation pattern, the predetermined operation pattern to apply at least one predetermined operating condition to change an operating state of the fuel cell as recited in claims 1 and 16. The Fuglevand reference discloses predetermined performance parameters that are determined by various means such as experiment, operational history, or electric load. These predetermined performance parameters are equivalent to the predetermined operation patterns claimed by the appellant. Fuglevand et al also discloses operating conditions such as voltage and current outputs that change the operational state of the fuel cell according to the predetermined performance parameters. Fuglevand et al also discloses that the operational parameters which are monitored, tend to suggest that a selected fuel cell is beginning to fail, and should be disconnected from the stack for repair or replacement if the shortcoming performance is severe (See column 8, lines 23-32). Therefore, Fuglevand et al provides specific guidance to monitor and control fuel cell operation based upon predetermined parameters, to change fuel cell operation according to the monitored parameters; and to further diagnose the fuel cell failure state accordingly. Hence, Fuglevand et al provides the necessary functional interrelationship to satisfy the claimed requirement.

The appellant argues that the "predetermined performance parameters" of Fuglevand do not change an operational state of the fuel cell as required by the present claims, the operational state of the fuel cell, i.e. on/off, is changed in response to the

predetermined performance parameters of Fuglevand by determining whether to turn the fuel cell on or off. Therefore, the present claims still read on the Fuglevand reference because the "predetermined performance parameter" taught by Fuglevand is equivalent to the "predetermined operation pattern" of the applicant.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Tony Chuo

Tony Chuo

Conferees:

Patrick Ryan

William Krynski